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| 09/932,082 | 08/17/2001 | Gregory Robert Roelofs | US018121 | 5453 |

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| EXAMINER |
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LEE, HWA C

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| ART UNIT | PAPER NUMBER |
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2672

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/932,082

Applicant(s)

ROELOFS, GREGORY ROBERT

Examiner

Hwa C Lee

Art Unit

2672

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>5</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-10, 12-32, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Hewlett Packard HP 48 Owner's Manual.

3. In regards to claim 1, Hewlett Packard HP 48 Owner's Manual discloses the following:

A system comprising a control unit that receives a data set that is too large to display on a display of finite dimensions,

- Hewlett Packard HP 48 Owner's Manual describes the properties of HP 48, which is a scientific calculator with graphing functions. Data is inputted to HP 48 and stored using the stack, which is a series of storage location for numbers and other objects (Page 2-3). A user interface comprising a display and a keyboard allow the user to input said data (Pages 2-4 to 2-5). Said user interface is specifically a ***control unit that receives a data set***. In addition, HP 48 allows data transfer between two HP 48s or between an HP 48 and a computer or with an HP 48 and any other serial device, such as a printer (Page 33-1). Said transfer of data requires proper setting of the I/O parameters (Page 33-4). Transfer of data

between two HP 48s is executed using the infrared port (Pages 33-8 to 33-9), and transfer of data between a HP 48 and a computer is executed using a serial interface cable (Pages 33-10 to 33-13). Thus the communication port using the I/O parameters is also specifically a ***control unit that receives a data set.***

- The Equation Writer application allows the user to enter algebraic expressions and equations (Pages 16-1 to 16-10). Once the equations are entered, graphs of the equations are drawn using the Plot application (Pages 18-1 to 18-4). Some of the equations (i.e., trigonometric functions: Sine, Arc Sine, Cosine, Arc Cosine, Tangent, Arc Tangent (Page 9-9)) entered using the Equation Writer application specifically are data sets too large to display on a display of finite dimensions. Thus, X and Y-axis display ranges must be specified in order to display the said large data set on a display of finite dimensions (Pages 18-8 to 18-14).

the control unit mapping at least a displayable portion of data points contained in the data set onto the display by applying a mathematical equation comprising a nonlinear and continuous mathematical function having a finite range and at least one independent variable of infinite domain,

- By interfacing with said user interface (display and keyboard), the equations entered using the Equation Writer can be plotted by first setting the plot parameters using the PLOTR menu in the PLOT function menu

(Pages 18-8 to 18-10) and then drawing the graph of said equations using the DRAW menu (Pages 18-11 to 18-14). Said equations represent a dataset of infinite domain (for example, Arc Tangent (ATAN)). When drawing a graph of $y = \text{ATAN}(x)$ as entered using the Equation writer, the graph is a display of the data set represented by the function $\text{ATAN}(x)$, wherein applying $y = \text{ATAN}(x)$ specifically is applying **a mathematical equation comprising a nonlinear and continuous mathematical function**. In addition, the dependent variable (y) has a finite range (i.e., from $-\pi/2$ to $+\pi/2$), and the independent variable (x) has an infinite domain. For the purpose of drawing the dataset to be displayable, the x and y ranges are inputted by the user through the user interface as applied above.

the displayable portion of the data points being displayable on the display,

- By specifying the x and y range, the data is displayable on the display as applied above.

the displayable portion being determined by selecting one of the data points in the data set to correspond to a reference position on the display,

- In order to draw the graph of the equation (data set), the display range or scaling must be set. One method of setting said display range or scale is to select the "center" of the graph (Page 18-9 to 18-10). By setting the "center", the center of the display is selected, which specifically is

selecting one of the data point in the data set to correspond to a reference position on the display.

the data set being traversed on the display by changing the selected data point that corresponds to the reference position.

- A different region of the graph can be plotted without rescaling by pressing the directional buttons and changing the “center” position of the display while in the DRAW mode (Page 18-22, 3rd paragraph). Plotting a different region without rescaling is specifically ***traversing the data set on the display by changing the selected data point that correspond to the reference position***. In addition, the x, y display range can be changed to display a different portion of the data set, and said x, y display range specifically are reference positions since the portion of the data set to be displayed is dependent on the x, y display ranges.

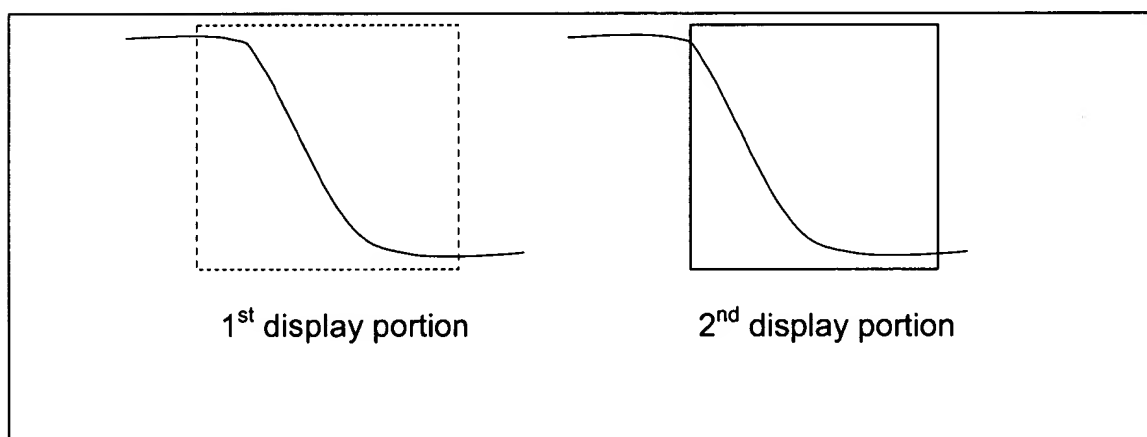
4. In regards to claim 2, the same basis and rationale for claim rejection as applied to claim 1 above are applied.

The system as in claim 1, wherein a first displayable portion of the data set is replaced with a second displayable portion of the data set when traversed.

- Traversing the data set as applied above (plotting a different region of the graph) specifically is ***replacing the first displayable portion of the data set with as second displayable portion of the data set*** since a different region of the graph is now displayed on the display screen.

5. In regards to claim 3, the same basis and rationale for claim rejection as applied to claim 2 are applied.

- When performing the said plotting of a different regions of the graph (traversing the data set), the data points located in between the first reference point and the second reference point are traversed in a continuous and nonlinear manner in accordance with the mathematical function. By pressing the directional button and selecting a new center point as applied to claim one above, the new display portion of the data set is the graph of the new displayable data points not visible before the said traversal. The said plotting of the new region of the data set specifically is moving the display window of the graph along the independent (x) axis having infinite domain as shown by the following diagram.



In addition, the plot coordinates can be changed to include more data points of the data set to be displayed using the PICT function (Pages 19-8 to 19-11).

6. In regards to claim 4, the same basis and rationale for claim rejection as applied to claim 1 are applied. The “center” reference point specifically is a ***central position of the displayable portion of data points on the display.***

7. In regards to claim 5, the same basis and rationale for claim rejection as applied to claims 1 and 3 are applied. By using the Equation Writer, said equation (representing a data set) can be modified, and since equations comprising trigonometric functions are by definition nonlinear, any modification in the equation will be nonlinear. For example, said equation of $y = \text{ATAN}(x)$ as applied above, can be modified to multiply by a factor of $(5 \cdot \cos(x))$, which results in a modified equation of $y = (5 \cdot \cos(x)) \cdot \text{ATAN}(x)$. Thus $(5 \cdot \cos(x))$, the coefficient of $\text{ATAN}(x)$, which specifically is a parameter of the mathematical function, is adjusted. Thus, the y-axis is scaled in a non linear fashion. In addition, the x, y display range can be manually changed as applied to claim 1 above.

8. In regards to claim 6, the same basis and rationale for claim rejection as applied to claim 1 are applied. The independent variable (x) of infinite domain is by definition ***unbounded in at least one of magnitude and number.***

9. In regards to claim 7, the same basis and rationale for claim rejection as applied to claim 1 above. Drawing or plotting the example equation of $y = \text{ATAN}(x)$ is specifically ***mapping data points of the data set onto the display as the at least one***

independent variable of the mathematical function. The independent variable specifically is ***at least one independent variable of the mathematical function.***

10. In regards to claim 8, the same basis and rationale for claim rejection as applied to claim 1 above. The example equation of $y = \text{ATAN}(x)$ comprises specifically ***a data set too large to display due to the number of data points in the data set.*** Thus, in order to display the data set, the x, y display range must be specified, which specifies the display portion of the said ***too large data set.***

11. In regards to claim 9, the same basis and rationale for claim rejection as applied to claim 8 above. Too many data points specifically is too large of data range. In addition, the x, y display data range can be inputted with a range too large to be displayed on the display screen.

12. In regards to claim 10, the same basis and rationale for claim rejection as applied to claims 1 and 7 above. Said display of data set as applied to claim 1 above clearly represents ***one-dimensional data set with at least one independent variable of the function.***

13. In regards to claim 12, the same basis and rationale for claim rejection as applied to claims 1 and 3 above. Once the x, y display range of the equation is set by the user, the equation is completely displays the data points within the set range.

14. In regards to claim 13, Hewlett Packard HP 48 Owner's Manual discloses the limitations of ***the system according to claim 1, wherein the displayable portion is mapped on an axis of the display and the scale of the axis continually changes*** (Page 18-22 to Page 18-24). The ZOOM function by rescaling the axes specifically

changes the scale of the axis continually as the ZOOM area is changed using the directional button.

15. In regards to claim 14, the same basis and rationale for claim rejection as applied to claims 3-5 and 13 are applied. On Page 18-23, the method of zooming on a particular region using the Z-BOX function and the directional button. When the data set is not traversed, the user can apply a ZOOM factor of 2, which specifically ***provides a relatively expanded scale for the data mapped about the midpoint of the displayable portion.*** The user can then move the area to zoom as the portion of the graph to the right or left of the "center" reference point and then apply a ZOOM factor of 0.5 (less than 1) to show half the axis (Page 18-22), which specifically is ***a continually reduced scale on each side of the midpoint of the displayable portion as the mapping approaches ends of the axis.***

16. In regards to claim 15, the user interface comprising a display and a keyboard as applied to claim 1 above is specifically a ***user interface that provides input to the control unit, wherein the user interface allows the user to do at least one of entering at least some of the data points of the data set, changing the parameters of the mathematical equation and selecting the displayed data points.***

17. In regards to claim 16, the same basis and rationale for claim rejection as applied to claim 15 are applied. The said user interface comprises of selectable menu displayed on the bottom of the display screen, which specifically is a GUI (Page 1-2, No. 8). In addition, the keyboard including the directional button is also specifically a GUI

since the directional button allows for cursor movement (Page 18-20) and coordinate determination on a display.

18. In regards to claim 17, the same basis and rationale for claim rejection as applied to claim 1 are applied. The example equation of $y = \text{ATAN}(x)$ has a finite range for the dependent variable (y) as applied to claim 1 above. The display of the equation will display the y-axis corresponds to the finite range ((i.e., from $-\pi/2$ to $+\pi/2$), which specifically is the displayable portion. The finite range for the independent variable (x) is due to the mathematical function. In addition, any equation with a constant coefficient for the independent variable (x) will comprise a finite y-axis range.

19. In regards to claim 18, Hewlett Packard HP 48 Owner's Manual discloses the limitation of applying axis labels (Page 19-2, Last Paragraph – Page 19-3). In addition, the coordinates of any point on the display can be added selectively and variably to any point on the display (Page 18-28; Page 18-31, 3rd Paragraph; and Page 18-34). The cursor positioned at any point on the axis must display the coordinate of said cursor position, which specifically is **marked and labeled axis**.

20. In regards to claim 19, Hewlett Packard HP 48 Owner's Manual discloses the limitation of **wherein the mathematical function is one selected from the group of arc tan, cot, tanh and \sin^{-1}** (Page 9-9 and Page 9-6).

21. In regards to claim 20, the same basis and rationale for claim rejection as applied to claims 1 and 3 are applied. **Traversing the data set in a nonlinear and continuous fashion across the displayable portion in accordance with mathematical function upon continuous section selection of consecutive data**

Art Unit: 2672

points as the data point corresponding to the reference position on the display

specifically is changing the "center" reference position to traverse the data set as applied to claim 3 above. Since the mathematical equation ($y = \text{ATAN}(x)$) is nonlinear by definition, traversing said equation on a graph by selecting consecutive data points specifically is nonlinear and continuous. In addition, the user can selected a random data points in order, wherein the data points are non-equal distance apart from each other, for use as the "center" reference point. By selecting non-equal distance apart data points, the ***traversal of the data set will be non linear and continuous fashion.***

22. In regards to claim 21, the same basis and rationale for claim rejection as applied to claim 20 are applied. Using ***at least a portion of the consecutive data points as a reference position parameter in the mathematical function to calculate consecutive displayable portions of the data set in order to traverse the data set across the displayable portion in the nonlinear and continuous fashion*** specifically is changing the "center" reference position to traverse the data set as applied to claim 3 above. The use can selected a random data points in order, wherein the data points are non-equal distance apart from each other, for use as the "center" reference point. By selecting non-equal distance apart data points, the ***traversal of the data set will be non linear and continuous fashion.*** In addition, since the selection of said data points are random but in order, the said selected points are ***at least a portion of the consecutive data points.***

23. In regards to claim 22, the same basis and rationale for claim rejection as applied to claim 1 are applied.

24. In regards to claim 23, the same basis and rationale for claim rejection as applied to claims 1 and 3 are applied. The system of processing a data as applied to claim 1 above is executed by a software comprising a plurality of functions running on the scientific calculator, which specifically is a hand held computing apparatus with memory, processor, and a plurality of software executing instructions to perform the functions of the scientific calculator. In addition, the HP 48 scientific calculator as disclosed by the Hewlett Packard HP 48 Owner's Manual discloses creating user created programs (Page 1-40 to Page 1-43), and allows the user to download files, which specifically comprises software as applied to claim 1 above. In addition, in order for said software to draw the equation and output the displayable portion to the display screen, the software must calculate (determine) all points within the user specified x, y display range and display those points according to the mathematical function of said equation. Further, the specific data points to be determined by the drawing function are dependent upon the selection of the "center" reference point and said x, y display range.

25. In regards to claim 24, the same basis and rationale for claim rejection as applied to claims 5 and 23 are applied.

26. In regards to claim 25, the same basis and rationale for claim rejection as applied to claims 6 and 23 are applied.

27. In regards to claim 26, the same basis and rationale for claim rejection as applied to claims 7 and 23 are applied.³

28. In regards to claim 27, the same basis and rationale for claim rejection as applied to claims 8-9 and 23 are applied.

29. In regards to claim 28, the same basis and rationale for claim rejection as applied to claims 15 and 23 are applied.

30. In regards to claim 29, the same basis and rationale for claim rejection as applied to claims 17 and 23 are applied.

31. In regards to claim 30, the same basis and rationale for claim rejection as applied to claims 19 and 23 are applied.

32. In regards to claim 31, the same basis and rationale for claim rejection as applied to claims 20 and 23 are applied.

33. In regards to claim 32, the same basis and rationale for claim rejection as applied to claim 23 are applied. Hewlett Packard HP 48 Owner's Manual clearly discloses communicating between two HP 48 calculators or between a HP 48 calculator and a computer using a Local/Local or Local/Server connection (Page 33-2 to 33-3).

34. In regards to claim 38, the same basis and rationale for claim rejection as applied to claim 1 are applied. The nonlinear, continuous mathematical functions as applied to claims 1, 19 and 30 are used to create equations using the Equation Writer as applied to claim 1 above. Such equation creation specifically is modeling the nonlinear, continuous mathematical functions. In addition, Hewlett Packard HP 48 Owner's Manual discloses the limitation of statistical application, wherein statistics are calculated and drawn as plots on a display screen. Said calculating and drawing of statistics comprises "Curve-fitting with four models (linear, logarithmic, exponential, and power)" (Page 21-1). Logarithmic, exponential and power models specifically are nonlinear continuous mathematical functions.

Claim Rejections - 35 USC § 103

35. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

36. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

37. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hewlett Packard HP 48 Owner's Manual in view of Byrne, et al.

38. In regards to claim 11, Hewlett Packard HP 48 Owner's Manual discloses all limitations of claims 1 and 10 above, but does not explicitly disclose the limitation of a multi-dimensional data set. Byrne et al. Clearly discloses the said limitation (Page 17, Left Col., 3D Plotting – Page 18).

39. It would have been obvious to one of ordinary skill in the art to take the teachings of Hewlett Packard HP 48 Owner's Manual and to add from Byrne et al. the method of 3D Plotting in order to display a multidimensional data set. In addition, Hewlett Packard

HP 48 Owner's Manual describes the HP 48 scientific calculator, and Byrne et al. describes HP 48G scientific calculator, which is the updated model of HP 48. HP 48G improved upon the HP48 by adding new functions comprising the 3D Plotting function, and thus the combination is obvious and has already been performed.

40. Claim 33-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hewlett Packard HP 48 Owner's Manual in view of Roschelle et al., U.S. Patent No. 6,628,918.

41. In regards to claim 33, Hewlett Packard HP 48 Owner's Manual discloses the limitation of connecting the HP 48 calculator with a computer using a Local/Local or Local/Server setup in order to transfer files between the devices as applied to claim 32 above. In addition, the limitation of receiving input parameter data from user is disclosed as applied to claims 15-16 above. Hewlett Packard HP 48 Owner's Manual does not explicitly disclose the limitation of a **remote server**.

42. Roschelle et al., however, clearly discloses the limitation of ***a remote server in communication with a local server, the remote server receiving input parameters delineating the displayable portion of the data set by a user at the local server, the remote server outputting to the local server a mapping of the displayable portion of the data set.***

- Roschelle et al. discloses an educational environment, wherein a plurality of thin client devices (hand held computing devices, which specifically are local servers), are in communication with a networked server computer (remote server). Said networked thin client devices comprise wireless

capability (Col. 3, lines 16-35 and lines 43-58). In addition, said networked thin client devices comprise a wide variety of features. Said features comprise a means of graphic and textual output and a means of networking with other like devices and with a server. Said networked client devices comprise personal digital assistants, handheld gaming toys, cell phones, tablet-based computers, personal computers, and graphing calculators (Col. 3, line 59 – Col. 4, lines 9). Further, an infrared (IR) I/O system allows for data transfer with peer devices of any type that support similar IR emitter and sensor and a compatible communication protocol (Col. 4, line 63 – Col. 5, line 3).

- Roschelle et al. discloses using said networking system to interact between the remote host server and the local client server devices, wherein the remote host server in creating a final image uses the inputs from the local client server devices. Similar networking system is applied to HP 48 graphing calculator. Since Roschelle et al. discloses the limitation of the remote host server receiving input data from the local client server devices, the input data specifically is the input parameters for displaying the displayable portion of the data set, and the image outputted back to the local client server device from the remote host server is the output mapping of the displayable portion of the data set.

43. it would have been obvious to one of ordinary skill in the art to take the teachings of Hewlett Packard HP 48 Owner's Manual, and to add from Roschelle et al. the

networking system in order to exchange data between a remote host server and a local client server device. The HP 48 calculator comprises data transfer function using the built in I/O port with a serial cable connection or an IR connection. Thus, HP 48 calculator can communicates with a computer in order to exchange files, which specifically are input and output data for displaying the displayable portion of the data set. Since Roschelle et al. teaches connecting a plurality of networked thin client devices comprising a graphing calculator, the HP 48 calculator can be modified to connect to a remote server as taught by Roschelle et al. Then all data processing and displaying limitations as applied to claim 1 can be performed by exchanging the necessary input and output data between the remote server and the local server (HP 48 calculator).

44. In regards to claim 34, the same basis and rationale for claim rejection as applied to claims 32-33 are applied.

45. In regards to claim 35, the same basis and rationale for claim rejection as applied to claims 20 and 32-34 are applied.

46. In regards to claim 36, the same basis and rationale for claim rejection as applied to claim 32 are applied. In addition, Roschelle et al. discloses the limitation of the remote host server connecting to remote data on the Internet (Col. 3, lines 43-57). In order to access the remote data on the Internet, a website must be used as the interface for accessing said remote data.

47. In regards to claim 37, the same basis and rationale for claim rejection as applied to claims 32-36 are applied.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hwa C Lee whose telephone number is 703-305-8987. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 703-305-3885. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hwa C Lee
Examiner
Art Unit 2672

HCL
03/17/04



JOSEPH MANCUSO
PRIMARY EXAMINER